

ABSTRACT

A method of nitriding a gate oxide layer by annealing a preformed oxide layer with nitric oxide (NO) gas is disclosed. The nitridation process can be carried out at lower temperatures and pressures than a conventional nitrous oxide anneal while still achieving acceptable levels of nitridation. The nitridation process can be conducted at atmospheric or sub-atmospheric pressures. As a result, the nitridation process can be used to form nitrided gate oxide layers in-situ in a CVD furnace. The nitrided gate oxide layer can optionally be reoxidized in a second oxidation step after the nitridation step. A gate electrode layer (e.g., boron doped polysilicon) can then be deposited on top of the nitrided gate oxide layer or on top of the reoxidized and nitrided gate oxide layer.